
इस्पात की अलमारी
(समायोज्य प्रकार) — विशिष्टि
(तीसरा पुनरीक्षण)

Steel Shelving Cabinets
(Adjustable Type) — Specification
(Third Revision)

ICS 97.140

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FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Furniture Sectional Committee had been approved by the Civil Engineering Division Council.

This standard was first published in 1965 and subsequently revised in 1974 and 1984. In this revision, the following major modifications have been carried out:

- a) Reference standards for raw material and requirements have been updated;
- b) Provision for use of powder coating has been added;
- c) Provision for standard marking has been updated;
- d) Overall dimension and its tolerances for have been modified;
- e) Provision related to shelves, doors and mirror has been modified;
- f) Aluminium based alloy has been introduced for handles;
- g) Inside dimensions of locker have been updated;
- h) Provision related to hanging rod has been modified,
- j) Loadings for shelving cabinets have been modified, and
- k) Clauses for sampling and criteria for conformity and acceptance criteria have been applied.

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

STEEL SHELVING CABINETS (ADJUSTABLE TYPE) — SPECIFICATION

(Third Revision)

1 SCOPE

This standard covers the requirements for materials, sizes, construction and finish of adjustable steel shelving cabinets with hinged doors with or without the provision of a locker.

2 REFERENCES

The standards listed in Annex A contains provisions, which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standard indicated at Annex A.

3 MATERIAL

3.1 Aluminium Tube

Aluminium tubes shall conform to IS designation 65032 of IS 1285.

3.2 Electrodes

The welding electrodes for gas, arc, and spot welding shall conform to IS 1278, IS 814 and IS 4972, respectively.

3.3 Mild Steel Sheets

Steel sheets shall conform to Grade HR1 of IS 1079 or Grade CR1 of IS 513 (Part 1).

3.4 Mild Steel Rounds and Flats

Mild steel rounds and flats shall conform to Grade E250 of IS 2062.

3.5 Screws

Screws shall conform to IS 1365.

4 DIMENSIONS AND TOLERANCES

4.1 Dimensions

The dimensions of both the types of shelving cabinets shall be as given in Table 1 (see Fig. 1).

NOTE — Minimum clearance required for the shelving cabinets to be put into recesses or openings, where required, shall be as follows:

- | | | |
|-----------------------------|---|------------|
| a) For top of cabinet | : | 20 mm, |
| b) For each side of cabinet | : | 10 mm, and |
| c) For depth of cabinet | : | 5 mm |

4.2 Tolerances

The overall dimensions specified in 4.1 and 5.10 shall not vary by more than ± 10 mm.

5 FABRICATION

5.1 Components

Steel shelving cabinets shall be assembled from the components given in 5.2 to 5.10.

Table 1 Overall Dimensions of Shelving Cabinets

(Clause 4.1 and Fig. 1)

All dimensions in millimetres.

Sl No.	Size	Dimensions		
		Height ¹⁾	Width	Depth
(1)	(2)	(3)	(4)	(5)
i)	Small	1 150	760	430
ii)	Large	1 855	910	480

¹⁾ Excluding the height of pedestal.

5.2 Sides

The sides shall be made from steel sheet not less than 0.8 mm thick and without any burrs or dents. The width of the side sheets shall correspond to the depth of the top. The sides shall extend between the extreme surfaces of the top and bottom shelves.

5.3 Back

The back shall be made from steel sheet not less than 0.8 mm thick and without any burrs or dents. The width of the back sheet shall correspond to width of the top. The back shall extend between the extreme surface of the top and bottom shelves.

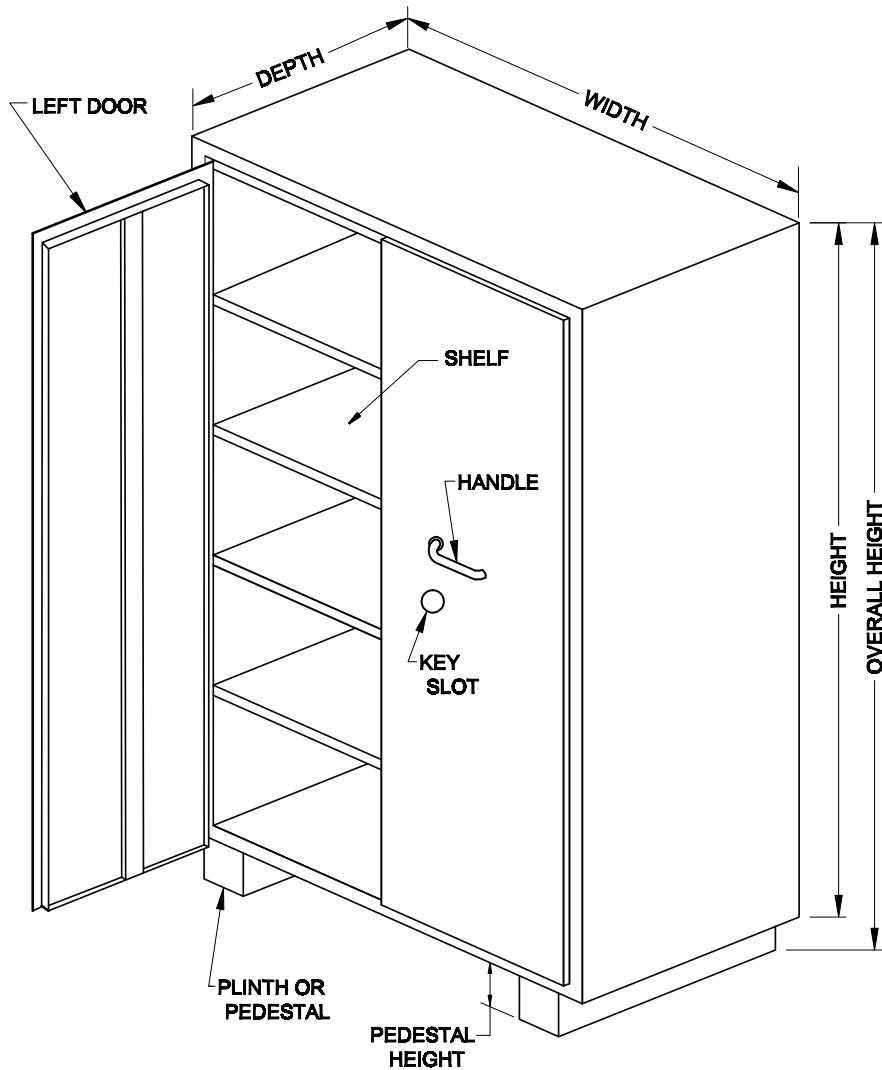


FIG. 1 TYPICAL SKETCH OF STEEL SHELVING CABINET

5.4 Top and Bottom

The length of the top and bottom shall cover the width of the cabinet and the breadth shall cover the depth of the cabinet. These shall be made from steel sheet not less than 0.8 mm thick without any burrs or dents.

5.5 Shelves

The shelves shall be made from steel sheet not less than 0.7 mm thick. Shelves shall have lipped flanges 35 mm in width and minimum 8 mm in depth. Each shelf shall be supported on four shelf brackets. The bracket shall be made of steel sheeting not less than 1.6 mm thick. The bracket shall be so designed and constructed that the shelf is securely supported and that adjustment inside the bracket can be affected easily. Four rack strips shall be provided for supporting the shelves,

covering the full height of the cabinet. Rack strips of steel shall be not less than 0.9 mm in thickness.

5.5.1 Shelf Supporting Arrangement

The shelves shall be supported on four adjustable brackets.

5.6 Doors

The steel shelving cabinets shall be provided with two door leaves as described in 5.6.1 and 5.6.2

5.6.1 Right Door

This shall be formed out of steel sheet not less than 0.8 mm thick having metal stiffeners suitably welded or riveted to stiffen the door. The centre-to-centre distance between two adjacent welding spots or rivets

shall not exceed 300 mm. The door shall be hinged to right side of the cabinet and shall have a hole for the handle and a key slot for the key of the lock. The clearance around the door between the door flanges and side, top and bottom flanges shall not be more than 1.25 mm.

5.6.2 Left Door

This shall be similarly constructed as the right door and hinged to the left side of the cabinet. The door shall have a rebate on the free end, over which the right door shall overlap. The clearance between the two doors when closed, and around the left door shall not be more than 1.25 mm.

5.7 Pedestal

The pedestal shall be made from steel sheet not less than 0.8 mm thick and shall be properly stiffened. The pedestal shall not project out of the cabinet and shall be 125 ± 5 mm, in height.

5.8 Hinges

The hinges shall be either plain butt type made from steel sheet not less than 1.6 mm thick or double folded type fabricated from mild steel sheets not less than 1.25 mm thick. The hinges shall be secured to the mild steel hinge brackets not less than 2.5 mm thick on one side and shall be secured to the door on the other side of the fulcrum. The number of hinges per door leaf shall be not less than two for small size and not less than three for large size.

5.9 Locks

Steel shelving cabinet shall be supplied with lock. The lock shall not be less than six lever lock with duplicate keys of non-corrodible material and conform to IS 729. For the locking arrangement, there shall be a three way bolting device controlled by a lock and operated by brass or zinc or aluminium base alloy handle.

5.10 Lockers

The inside dimensions of lockers for both types of shelving cabinets shall be as given in Table 2.

Table 2 Inside Dimensions of Lockers

(Clause 5.10)

All dimensions in millimetres.

Sl No.	Size	Inside Dimensions		
		Height	Width	Depth
(1)	(2)	(3)	(4)	(5)
i)	Small	200	758	350
ii)	Large	300	908	430

5.10.1 Lockers Components

The locker shall be assembled from the components specified in 5.10.2 to 5.10.4.

5.10.2 Doors

Two doors shall be provided to the locker of large size shelving cabinet and one door to the locker of small size shelving cabinet. The doors shall be made out of steel sheets not less than 0.9 mm thick. The door shall have a cover fitted from inside to form a box section. This cover shall be made out of steel sheet not less than 0.63 mm thick.

5.10.3 Locks

Locker shall have a handle made out of non-corrodible material and shall be fitted with a lock as given in 5.10.3.1.

5.10.3.1 The locker shall be fitted with a lock having not less than six levers with duplicate keys made of non-corrodible material. For locking there shall be a two way bolting system controlled by the lock.

5.10.4 Drawer

There shall be two drawer units arranged side by side in large size shelving cabinet. These shall be made out of mild steel sheet not less than 0.8 mm thick. The drawers shall work on single extension principle and shall be fitted with a suitable lock having not less than four levers with duplicate keys made out of non-corrodible metal. The minimum overall dimensions of the drawers shall be as follows:

- Width 300 mm,
- Depth 400 mm, and
- Height 140 mm.

6 ASSEMBLY

6.1 The various components shall be assembled by means of bolting or welding.

6.2 The method of gas welding, arc welding and spot welding shall conform to IS 1323, IS 816 and IS 819, respectively.

7 ADDITIONAL ACCESSORIES

The following additional accessories may be provided, if so desired by the purchaser:

- Hanging rod** — This shall be of mild steel conforming to IS 7138 or aluminium tubular pipe with a wall thickness of not less than 1.6 mm and 20 mm in diameter. The mildsteel hanging rod shall be 19 mm round ERW tube of 1 mm thickness with min 25 micron nickel-chrome plating. The hanging rod shall be fitted to the cabinet lengthwise with suitable brackets.

- b) *Mirror frame (if provided)* — This shall be of mild steel sheet not less than 0.8 mm thick bent in a frame of 25 mm border and screwed generally to the left door on the outside.
- c) *Mirror* — The mirror shall be not less than 4 mm thick. It shall be sizes 1 250 × 300 mm or 400 × 300 mm as specified in IS 6184 and shall be of plate glass.
- d) *Tie hanger* — This shall be made out of aluminium or mildsteel sheet not less than 0.63 mm thick. The mild steel tie hanger shall be finished in accordance with 8.

8 LOADING

The maximum static loads uniformly distributed and applied on the shelves may not exceed those given in Table 3. The loads may be taken as a guide in ordering shelves.

Table 3 Safe Distributed Loads for Shelves for Shelving Cabinets

(Clause 8)

SI No.	Width	Depth	Load (in UDL)
	mm	mm	kg
(1)	(2)	(3)	(4)
i)	760	430	60
ii)	910	480	80

9 FINISH

9.1 Sheet Metal Components

9.1.1 All dents, burrs and sharp edges shall be removed from the various components. The components shall be individually pickled, scrubbed and rinsed to remove grease, rust, scale or any other foreign element.

9.1.2 Immediately after pickling, all the mild steel parts shall be given phosphating treatment conforming to Class C of IS 3618. The process for application of phosphate coating shall be in accordance with IS 6005.

NOTE — Putty shall be applied to all the surfaces requiring filling and shall conform to IS 110. Aluminium primer shall conform to IS 11883.

9.1.3 Coat/coats of enamel paint shall then be applied as follows:

- Finish coat with enamels conforming to IS 151, IS 2932 (Part 1) or IS 2933 (Part 1);
- In case of stoving enamel the components shall thereafter be baked at a specified temperature in an oven heated uniformly. The finish shall be smooth and uniform with hard tough film of enamel strongly adhering to the surface. The finish shall be free from all visible defects and shall

not chip when tapped lightly with a dull pointed instrument; and

- Powder coating conforming to IS 13871.

9.2 All components shall be finished in colour as agreed to between the purchaser and the manufacturer.

10 PERFORMANCE REQUIREMENTS OF FINISH

10.1 Scratch Hardness Test

Scratch hardness test shall be carried out as per IS 101 (Part 5/Sec 2).

10.2 Pressure Test

Pressure test shall be carried out as per IS 101 (Part 5/Sec 1).

10.3 Flexibility and Adhesion Test

Bend test shall be carried out as per IS 101 (Part 5/Sec 2).

10.4 Stripping Test

Stripping test shall be carried out as per Annex C of IS 9862.

10.5 Test for Protection against Corrosion under Conditions of Condensation

Test for protection against corrosion under conditions of condensation shall be carried out as per IS 101 (Part 6/Sec 1).

11 SAMPLING

11.1 All the cabinets of same size and type manufactured under similar condition of production shall constitute a lot.

11.2 The number of cabinets to be selected from a lot shall depend upon size of lot and in accordance with Table 4.

11.3 The required number of cabinets for testing shall be selected at random. To ensure the randomness of selection, procedures given in IS 4905 may be followed.

Table 4 Size of Sampling for Cabinets

(Clause 11.2)

SI No.	Lot Size	Sample Size
(1)	(2)	(3)
i)	Up to 25	3
ii)	26 to 50	4
iii)	51 to 100	5
iv)	101 to 150	7
v)	151 to 300	10
vi)	301 and above	15

12 CRITERIA FOR CONFORMITY

12.1 The samples lot shall meet the dimension and tolerance requirements given in **4**.

12.2 The samples lot shall meet the finish requirements given in **9** and **10**.

12.3 The samples lot shall meet the loading requirements given in **8**.

13 INFORMATION TO BE SUPPLIED BY THE PURCHASER

The purchaser shall supply the following information to the supplier along with the order:

- a) Whether locker/drawer is required or not;
- b) Number of adjustable shelves required;
- c) Colour of finish; and
- d) Where alternative methods of construction and finish are specified, they shall be clearly stated in the order.

14 PACKING

All the component parts shall be packed in such a way that no damage is caused to them during transit.

15 MARKING

15.1 Steel shelving cabinets and its packing shall be legibly and indelibly marked with the following:

- a) Manufacturer's name or trade-mark, if any;
- b) Address of the manufacturer;
- c) Brand name;
- d) Lots/Batch/Serial number; and
- e) Date of manufacturing.

15.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the product(s) may be marked with the Standard Mark.

ANNEX A

(Clause 2)

LIST OF REFERRED INDIAN STANDARDS

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
101	Method of sampling and test for paints, varnishes and related products	1323 : 1982	Code of practice for oxy-acetylene welding for structural work in mild steels (<i>second revision</i>)
(Part 5/Sec 1) : 1988	Mechanical test on paint films, Section 1 Hardness test (<i>third revision</i>)	1365 : 2005	Slotted countersunk flat head screws common head style — Product grade A (<i>fourth revision</i>)
(Part 5/Sec 2) : 1988	Mechanical test, Section 2 Flexibility and adhesion (<i>third revision</i>)	2062 : 2011	Hot rolled medium and high tensile structure steel — Specification (<i>seventh revision</i>)
(Part 6/Sec 1) : 1988	Durability tests, Section 1 Resistance to humidity under conditions of condensation (<i>third revision</i>)	2932 (Part 1) : 2013	Enamel, synthetic, exterior: (a) undercoating (b) finishing — Specification: Part 1 For domestic and decorative applications (<i>fourth revision</i>)
110 : 2017	Ready mixed paint, brushing, grey filler for enamels for use over primers (<i>third revision</i>)	2933 (Part 1) : 2013	Enamel, exterior: (a) Undercoating (b) finishing — Specification: Part 1 For domestic and decorative applications (<i>second revision</i>)
151 : 2017	Ready mixed paint, spraying, finishing, stoving, enamel, for general purposes, colour as required (<i>second revision</i>)	3618 : 1966	Phosphate treatment of iron and steel for protection against corrosion
513 (Part 1) : 2016	Cold reduced low carbon steel sheets and strips: Part 1 Cold forming and drawing purpose (<i>sixth revision</i>)	4905 : 2015	Random sampling and randomization procedures (<i>first revision</i>)
729 : 1979	drawer locks, cupboard locks and box locks (<i>third revision</i>)	4972 : 1968	Resistance spot welding electrodes
814 : 2004	Covered electrodes for manual metal arc welding of carbon and carbon manganese steel (<i>sixth revision</i>)	6005 : 1998	Code of practice for phosphating of iron and steel (<i>first revision</i>)
816 : 1969	Code of practice for use of metal arc welding for general construction in mild steel (<i>fifth revision</i>)	6184 : 1971	Dimensions for furniture mirrors
819 : 1957	Code of practice for resistance spot welding for light assemblies in mild steel	7138 : 1973	Steel tubes for furniture purposes (<i>first revision</i>)
1079 : 2017	Hot rolled carbon steel sheet and strip (<i>seventh revision</i>)	9862 : 2017	Specification for ready mixed paint, brushing, bituminous, black, acid, alkali, water and chlorine resisting (<i>first revision</i>)
1278 : 1972	Filler rods and wires for gas welding (<i>second revision</i>)	11883 : 2017	Ready mixed paint, brushing red oxide, priming for metals — Specification (<i>first revision</i>)
1285 : 2002	Wrought aluminium and aluminium alloys — Extruded round tube and hollow sections for general engineering purposes (<i>third revision</i>)	13871 : 1993	Powder coatings — Specification

ANNEX B*(Foreword)***COMMITTEE COMPOSITION**

Furniture Sectional Committee, CED 35

<i>Organization</i>	<i>Representative(s)</i>
In Personal Capacity (<i>Pratap Nursery Lane Near Gurudwara Sahib, Panditwari, Dehradun</i>)	SHRI K. S. PRUTHI (Chairman)
Association of Furniture Manufacturers and Traders (I), Mumbai	REPRESENTATIVE
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BIS Directorate General	SHRI SANJAY PANT, SCIENTIST 'F' AND HEAD (CIVIL ENGINEERING) [REPRESENTING DIRECTOR GENERAL (<i>Ex-officio</i>)]

Member Secretaries

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SCIENTIST 'C' (CIVIL ENGINEERING), BIS

AND

SHRI ABHISHEK PAL
SCIENTIST 'C' (CIVIL ENGINEERING), BIS

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Amendments Issued Since Publication

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